PEDAGOGICAL AND PSYCHOLOGICAL FEATURES OF THE DEVELOPMENT OF PROFESSIONAL QUALITIES IN FUTURE ENGINEERS

Mirkhodjayeva Dilorom Batirovna -
Senior lecturer, Tashkent Institute of Textile and Light Industry, researcher at Tashkent State Pedagogical University named after Nizami

Abstract. *The article scientifically reveals the pedagogical and psychological features of the development of professional qualities in future engineers. From the standpoint of the personal-activity approach, we determined the essence of professionally important qualities, features of the development of professional qualities of future engineers, as socio-psychological, psychological and psychophysiological qualities that meet the requirements of engineering and professional activities and determine successful adaptation to activities, effective training in their specialty and effective performing activities in a specific special position.*

Keywords: *profession, qualities, future engineers, pedagogical and psychological characteristics, popularity, nanotechnology, IT technologies.*

Obtaining a specialty as an engineer remains prestigious among the younger generation. Examples of the particular popularity of engineering professions include the field of IT technologies, advances in chemical science (nanotechnology), and improvements in the military-technical complex. The training of technically savvy young specialists within the framework of modern educational trends is a priority task of Russian science, education, and the industrial complex, as it solves one of the problems of personnel shortages determined by their aging. Interest in the individual psychological foundations of future engineers, contributing to the efficiency and reliability of professional activity, is also due to the fact that even in relatively standard types of engineering (construction, transport, resource extraction, agro-industry) changes in the content of labor can be traced at the level of sophistication of means, features of execution and etc.

Another pattern that makes adjustments to ideas about classical types of engineering activity is that the effectiveness of many of them depends on the ability to synthesize several of its types to solve the problems assigned to the engineer. Thus, a modern engineer carries out his managerial functions directly in the process of technical and technological labor management in production, i.e. We are talking about engineers working in factories and large enterprises.

Modern engineering activity is filled with the need to solve problems of economic, organizational and social order in a situation of intensive growth of both the scale of

production and the complication of orders. The overall effectiveness in implementing the labor functions of an engineer with such versatility and responsibility for the collective result depends on the ability to apply classical forms of engineering activity in a comprehensive manner.

This circumstance proves that attention to the dynamics of psychological determinants of professional reliability is becoming one of the most relevant within the framework of labor psychology, engineering psychology and cognitive ergonomics, and its study at all stages of professionalization in order to determine universal criteria remains an important task [1, p. 23] .

In labor psychology and engineering psychology, the problem of success in professional activity is central and is presented in the studies of A.B. Bodrova [2. Page 113], A.A. Derkach [3, 752 pp.], E.A. Klimova [4, 301 p.], T.M. Krasnyanskaya [5, 280 p.] and others. Currently, there are enough works devoted to the study of the success of professional activities in teaching A.A. Lezhenina, I.V. Arendachuk [6, pp. 183-187], psychological and acmeological concept of the development of professional health of specialist G.G. Verbin [7, 54 p.], military I.V. Dryupina, G.R. Pozova, V.I. Khamkov [8, 24 p.].

The study of psychological factors in the success of the professional activities of metrology engineers is due to the ambiguous and complex situation emerging in the domestic labor market. In recent years, contradictions have intensified between the requirement to improve product quality and the actual reduction of specialists responsible for quality, including employees of metrological services. Employers are placing increasingly high demands on both the level of education, professional competence, performance, and personal qualities of employees.

The current problem of the success of the professional activities of engineers, the need to solve the problem of identifying psychological factors that not only influence adaptation to professional activities and mastery of professional responsibilities in accordance with the requirements of employers, but also allow assessing and predicting the effectiveness of activities and capable of maintaining professional health, is currently not raise doubts.

Determination of the essential characteristics of reliability by identifying indicators of the quality of performance of professional activities is undertaken using the example of railway transport specialists. Such objective criteria are factors that ensure production safety (maintaining the stability and reliability of traffic support systems, the absence of disruptions in the movement of trains, the health and safety of employees). At the psychological level, the importance of successful and rapid adaptation of young employees to the conditions of professional activity is noted [9, pp. 8-12].

It should be noted, as A.A. Blaginina noted, that the first developments of the problem of labor reliability are associated with engineering activities in the types of professions “man-equipment”, “human-operator”. The focus of attention fell on pilots and

operators of complex technical systems, and the determinants of labor reliability became psychophysiological parameters that contributed to operating at safe and error-free levels under the maximum possible and stable loads [10, 299 pp.]. Of all the known types of engineering (operation, design, planning, invention, construction, research), in this case, more attention was paid to specialists operating the equipment. In all of the above cases, researchers note that the path to the required level of professional reliability is achieved through a consistent build-up and refraction of the psychological determinants of professional activity (psychophysiological, individual psychological, personal, moral, adaptation, self-regulation, etc.) [11, 141 p.]. It is its specific conditions that give rise to typical requests for the development of training programs and socio-psychological assessment of personnel [12, 303 pp.]. This unique personality trait of a professional is formed gradually from the moment of admission to the relevant educational institution and at all stages of professionalization. Professional preparation for work is important for the formation of a special structure of professionally important qualities, and mistakes made in this process can lead to a partial or complete mismatch of a person with work and formal signs of reliability.

Main directions of engineering psychology. Analysis of human tasks in control systems, distribution of functions between humans and automatic systems, including those with artificial intelligence.

Study of the joint activities of operators, communication processes and information interaction between them.

Analysis of the psychological structure of operators' activities.

Study of factors influencing the efficiency, quality, accuracy, speed, reliability of operators' actions.

Study of human information reception processes, study of human sensory "inputs".

Study of the formation of commands to perform control actions by a person, the characteristics of speech and motor "output".

Analysis of the processes of human information processing, its storage and decision-making, psychological mechanisms for regulating the activities of operators.

Development of methods of psychodiagnostics, professional guidance and selection of camera specialists.

Development of methods to protect operators from emotional burnout.

Analysis and optimization of operator training processes.

Using research results for the design and operation of human-machine (human-information) systems.

Using research findings for virtual psychology.

In the process of development of engineering psychology, there was a transition from the study of individual elements of activity to the study of work activity as a whole, from considering the operator as a simple link in the control system to considering him as a

complex, highly organized system, from a machine-centric approach to an anthropocentric one.

In connection with the approaching era of nanotechnology, a new direction in psychology is being formed - nanopsychology, so new tasks will arise for engineering psychology.

Conclusions. Psychological support for engineers is a process of targeted social, psychological and pedagogical influence on an individual (group of people) in the interests of developing motivational, emotional, coinciding mechanisms, mental states and attitudes necessary for effective professional activity under the influence of professional stressors. A generalized model of a multi-level system of psychological support and support for the professional activities of engineers has been created, including a complex of hierarchically interconnected subsystems of psychological support and support for the professional activities of institutions of higher professional education, enterprises, institutions of additional professional education, and methodological associations (professional community). The main areas of work to preserve and maintain the professional health of engineers include: a) a number of measures to ensure the psychological safety of the organizational environment of the enterprise; b) monitoring the psychological state of employees; employee-oriented professional certification.

References:

1. Ariskin I.T. Learning process Text. / I.T. Ariskin. Rostov-n/D.: Ministry of Education of the RSFSR, 1966. - 23 p.

2. Bodrov V.A. The problem of coping with stress. Part 3: Strategies and styles for coping with stress Text. / V.A. Bodrov // Psychological Journal. 2006. - №3. - P. 113.

3. Derkach A.A. Acmeological foundations for the development of professionalism Text. / A.A. Derkach. - Moskov. psychol.-social Institute; Voronezh: NPO "MODEK", 2004. - 752 p.

4. Klimov E.A. Psychology of professional self-determination Text. / E.A. Klimov. - Moscow: Publishing house. Center Academy, 2007. - 301 p.

5. Krasnyanskaya T.M. Psychology of self-security: monograph Text. / T.M. Krasnyanskaya. Pyatigorsk: PGLU, 2009. - 280 p.

6. Lezhenina A.A. Psychological culture as the basis for professional success of a university teacher. Text. /A.A. Lezhenin // Bulletin of Kostroma State University. H.A. Nekrasova. - 2007. - T. 13. - P. 183-187

7. Verbina G.G. Psychological and acmeological concept of development of professional health of a specialist: abstract. dis. . Doctor of Psychology Sciences Text. / G.G. Verbina. Tambov, 2011. - 54 p.

8. Dryupina I.V. Psychological and ergonomic components of the success of official activities of a junior commander of a military educational institution. Text: abstract. dis. PhD. psychol. Sciences / I.V. Dryupin.- Moscow, 2007. - 24 p.

9. Abasov E.A. Designing innovations in the structure of teaching activities Text. / E.A. Abasov // Higher education today. - 2004. - No. 6. - P. 8-12.

10. Abulkhanova-Slavskaya K.A. Life Strategy Text. / K.A. Abulkhano-va-Slavskaya. M.: Mysl, 1991. - 299 p.

11. Eysenck Yu. The structure of human personality Text. / Yu. Eysenck. - Moscow: 2004.- 141 p.

12. Antsupov A.Ya. Social and psychological assessment of personnel Text. / AND I. Antsupov, V.V. Kovalev. - Moscow: UNITY-DANA, 2006. - 303 p.